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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/502,171	07/21/2004	Derk Reefman	NL020045	5517

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Philips Electronics North America Corporation
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EXAMINER

CHAU, COREY P

ART UNIT	PAPER NUMBER
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2615

SHORTENED STATUTORY PERIOD OF RESPONSE	MAIL DATE	DELIVERY MODE
3 MONTHS	01/11/2007	PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

If NO period for reply is specified above, the maximum statutory period will apply and will expire 6 MONTHS from the mailing date of this communication.

Office Action Summary

Application No.

10/502,171

Applicant(s)

REEFMAN ET AL.

Examiner

Corey P. Chau

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 21 July 2004.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-14 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-14 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
- ☐ Certified copies of the priority documents have been received.
 - ☐ Certified copies of the priority documents have been received in Application No. _____.
 - ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☒ Information Disclosure Statement(s) (PTO/SB/08)
Paper No(s)/Mail Date 1/6/05.
- 4) ☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____.
- 5) ☐ Notice of Informal Patent Application
- 6) ☐ Other: _____.

DETAILED ACTION

Claim Objections

1. Claim 9 is objected to because of the following informalities: on line 2, recites "said said convertor", which should be replaced with "said convertor". Appropriate correction is required.

Claim Rejections - 35 USC § 112

2. The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.
3. Claim 3 rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.
4. Claim 3, recites "said first and second sampling frequency are equal in magnitude", which is unclear to the examiner what is "said first and second sampling frequency" referring to.

Claim Rejections - 35 USC § 103

5. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

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6. Claims 1-14 are rejected under 35 U.S.C. 103(a) as being unpatentable over USPN 5581480 to Olson et al. (hereafter as Olson) in view of USPN 6255975 to Swanson.

7. Regarding Claim 1, Olson discloses a mixing system for mixing a plurality of digital audio signals (Figs. 1-3 and 6-7). Olson does not expressly disclose at least one of which is a noise-shaped oversampled digital audio signal having a predetermined sampling frequency and bit resolution. Swanson discloses a new Sony/Philips Super Audio Compact Disk (SACD) format, audio data is recorded on a high density optical disk using the SonyDirect Stream Digital (DSD) technology. Here, an oversampled delta-sigma modulator-based analog-to-digital converter (ADC) converts the analog audio streams being recorded into 64 fs (2.8224 MHz) 1-bit data streams, where fs, the sampling frequency, is the 44.1 kHz rate commonly used for CD recordings (Figs. 1C; column 1, lines 13-63; column 2, lines 43-63; column 3, line 6 to column 4, lines 17). Therefore it would have been obvious to one having ordinary skill in the art at the time of the invention to modify Olson with the teaching of Swanson for the apparatus of Olson to receive a new Sony/Philips Super Audio Compact Disk (SACD) format, audio data is recorded on a high density optical disk using the SonyDirect Stream Digital (DSD) technology and perform the method for mixing multiple channels of sampled digital audio using a non-linear clipping function thereby producing low order harmonics which are perceptibly less distorted to the human ear than high order harmonics created using hard clipping.

Furthermore, Olson as modified discloses said system comprising:

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a summing unit having a plurality of input terminals each for receiving a respective one of said plurality of audio signals, for computing a sum signal of said plurality of input signals (Olson, abstract; Figs. 1-3 and 6-7; column 2, lines 38-65; column 3, line 53 to column 4, line 21); and

a clipping unit having an input for receiving said sum signal, said clipping unit clipping said sum signal (Olson, abstract; Figs. 1-3 and 6-7; column 2, lines 59-65; column 4, line 8 to column 5, line 22; column 7, lines 20-58).

Olson as modified does not expressly disclose a filter unit between the input terminals and the clipping unit, arranged to selectively suppress frequency components outside an audio frequency band from the sum signal. However, the examiner takes Official Notice that it is well known in the art to provide a filter unit between the input terminals and the clipping unit in order to limit the bandwidth of the signal to provide a desired frequency response. Therefore it would have been obvious to one having ordinary skill in the art at the time the invention was made to modify Olson to incorporate a filter unit between the input terminals and the clipping unit in order to limit the bandwidth of the signal to provide a desired frequency response.

Furthermore, Olson as modified discloses a converter unit arranged to receive a clipped sum signal from the clipping unit and to convert said clipped sum signal into an output signal of said bit resolution, using noise-shaping, the clipping unit being arranged to limit the input values to a range of values that the converter is able to handle in a stable manner (Olson, abstract; Figs. 1-3 and 6-7; Swanson, Figs. 1C; column 1, lines 13-63; column 2, lines 43-63; column 3, line 6 to column 4, lines 17).

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8. All elements of Claim 2 are comprehended by Claim 1. Claim 2 is rejected for the reasons stated above apropos to Claim 1.

9. Regarding Claim 3, as best understood with regards to the 112, 2nd problem mentioned above, Olson as modified discloses said first and second sampling frequencies are equal in magnitude (Olson, abstract; Figs. 1-3 and 6-7; Swanson, Figs. 1C; column 1, lines 13-63; column 2, lines 43-63; column 3, line 6 to column 4, lines 17).

10. Regarding Claim 4, Olson as modified discloses said input signals and/or said output signals are of a DSD-format (Olson, abstract; Figs. 1-3 and 6-7; Swanson, Figs. 1C; column 1, lines 13-63; column 2, lines 43-63; column 3, line 6 to column 4, lines 17).

11. Regarding Claim 5, Olson as modified discloses said convertor unit comprises a Sigma-Delta Modulator (Olson, abstract; Figs. 1-3 and 6-7; Swanson, Figs. 1C; column 1, lines 13-63; column 2, lines 43-63; column 3, line 6 to column 4, lines 17).

12. Regarding Claim 6, Olson as modified discloses the clipped signal is maximized to a clip level compliant with said Sigma-Delta Modulator (Olson, abstract; Figs. 1-3 and 6-7; Swanson, Figs. 1C; column 1, lines 13-63; column 2, lines 43-63; column 3, line 6 to column 4, lines 17).

13. Regarding Claim 7, Olson as modified discloses said signal output is maximized to -3 dB as compared to the amplitude output of the Sigma-Delta Modulator (Olson, abstract; Figs. 1-3 and 6-7; Swanson, Figs. 1C; column 1, lines 13-63; column 2, lines 43-63; column 3, line 6 to column 4, lines 17).

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14. Regarding Claim 8, Olson as modified discloses said input channel comprises a down-sampling unit for down-sampling said input signal (Olson, abstract; Figs. 1-3 and 6-7; Swanson, Figs. 1C; column 1, lines 13-63; column 2, lines 43-63; column 3, line 6 to column 4, lines 17).

15. Regarding Claim 9, Olson as modified discloses said convertor unit comprises an up-sampling unit (Olson, abstract; Figs. 1-3 and 6-7; Swanson, Figs. 1C; column 1, lines 13-63; column 2, lines 43-63; column 3, line 6 to column 4, lines 17).

16. Regarding Claim 10, Olson as modified discloses the clipping unit is of a soft clipping type (Olson, abstract; Figs. 1-3 and 6-7; Swanson, Figs. 1C; column 1, lines 13-63; column 2, lines 43-63; column 3, line 6 to column 4, lines 17).

17. Claim 11 is essentially similar to Claim 1 and is rejected for the reasons stated above apropos to Claim 1.

18. Claim 12 is essentially similar to Claim 2 and is rejected for the reasons stated above apropos to Claim 2.

19. Regarding Claim 13, Olson as modified discloses the steps of filtering frequency components comprised in said mixed signal originating from said bit resolution and limiting an audio bandwidth of said input signals are combined in a single stage (Olson, abstract; Figs. 1-3 and 6-7; Swanson, Figs. 1C; column 1, lines 13-63; column 2, lines 43-63; column 3, line 6 to column 4, lines 17).

20. Regarding Claim 14, Olson as modified discloses mixing a plurality of noise-shaped oversampled digital audio signals having a predetermined sampling frequency

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and bit resolution (Olson, abstract; Figs. 1-3 and 6-7; Swanson, Figs. 1C; column 1, lines 13-63; column 2, lines 43-63; column 3, line 6 to column 4, lines 17).

Conclusion

21. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.

USPN 6041080 to Fraisse discloses a signal processing system and method for digitally mixing a plurality of analog input signals.

USPAPN 20020036578 to Reefman discloses a method and arrangement for synchronizing a sigma delta-modulator.

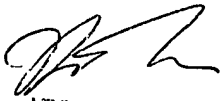
USPN 6285767 to Klayman discloses a low-frequency audio enhancement system.

22. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Corey P. Chau whose telephone number is (571)272-7514. The examiner can normally be reached on Monday - Friday 9:00 am - 5:00 pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Chin Vivian can be reached on (571)272-7848. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

January 7, 2007
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